

The License Illusion

Deliberate Airmanship



International Test Pilots School.



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WHY AIRMANSHIP DEMANDS MORE THAN A LICENSE

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Title: *The Licensing Illusion: Why Airmanship Demands More Than a License*

Executive Summary

Despite increasing regulations, advanced UAS technology, sophisticated AI automation, and advanced pilot certifications, the commercial drone sector continues to suffer from a critical blind spot: the neglect of airmanship as a core competency. Unlike traditional aviation, where airmanship forms the unseen backbone of safe, reliable, and adaptive flight operations, UAS programs across Canada, US and worldwide, consistently fail to educate, prepare and assess pilots in this deeper and critical dimension of performance.

This paper argues that regulatory compliance and technical skill are not enough. Without structured cognitive restraint—what military and civil aviation discipline calls *airmanship*—the industry will remain vulnerable to continued Flight Safety events, human factors breakdown, and operational weakness.

As a former combat flying instructor, UAS test pilot, and systems innovator in both manned and unmanned operations, I offer both a diagnosis and a solution rooted in lived experience, not theory. This isn't about better regulation or enhanced qualification—it's about building a better drone pilot corp.

Introduction

In the evolving landscape of unmanned aviation, the checklist has become a symbol of professionalism. It is invoked in nearly every training syllabus, regulatory audit, and safety brief. Yet, for all its ubiquity, the checklist is often misunderstood—treated as a static artifact rather than a living and dynamic tool for judgment. This paper argues that the overreliance on manufacturer-issued or simple text checklists, without addressing human factors like size, font, placement, juxtaposition, colour, orientation, is symptomatic of a deeper issue: the erosion of pilot decision-making efficiency in favour of automated systems that corrode responsibility.

Drawing on the perspective of a combat flying instructor and UAS test pilot, this paper explores how the illusion of procedural and regulatory compliance masks a lack of disciplined, decisive airmanship. It examines how operator stress distorts decision-making, and without scientifically sound resilience training, it leads to little mistakes and lost opportunities that could inherently avoid accidents.

It also argues that the current regulatory licensing fails to assess judgment adequately and the commercial training paradigm for drone pilots is insufficient. Basic flight schools are centered on producing certified or commercially licensed drone pilots who know the rules but regularly make bad decisions. While Operational training is left to companies and corporations, who are more focused on mission technology, sensors, and their own software products rather than self-awareness, resilience, decision making or discipline. Drawing on operational experience and psychological research, this paper explores the cognitive blind spots of drone operators, the cultural drift from traditional aviation airmanship norms, and the urgent need for a new model of operational training—one that re-centers physical and psychological factors, human decision making, communications, discipline and accountability at the heart of the mission.

The Problem: Procedural Compliance Without Cognitive Engagement

The checklist, in its ideal form, is a cognitive aid—a prompt for memory, a guard against complacency, and a framework for shared understanding. But in practice, many drone pilots treat checklists as bureaucratic compliance hurdle instead of a trusted living aid to Flight Safety and mission success. They are read aloud without reflection, copied from templates without adaptation, and reused again and again without feedback. This rote behavior creates a dangerous illusion: that safety is ensured by the presence of that document, rather than the mindset of the operator.

This illusion is reinforced by training programs that focus on regulatory compliance over operational judgment. Pilots are taught to “use a checklist,” but rarely challenged to ask *why* each item matters, *how* it applies to their specific mission, or *what* to do when the checklist is incomplete or not applicable. The result is a generation of operators who can recite procedures but struggle to adapt under the pressure of real world ops.

The democratization of drone technology has created a paradox. While access to aerial platforms is made ever easier, the psychological and procedural discipline required to operate them safely has not kept pace. Many drone pilots, particularly those without a background in manned aviation, equate technical proficiency with airmanship, what used to be known as “Stick and Rudder”. The ability to launch, navigate, and land a drone without incident is mistaken for mastery. This illusion is reinforced by the absence of personal physical consequences and the seductive reliability of automation. To quote Apollo Astronaut Frank Borman (first Apollo Commander to the moon). “A superior pilot uses his superior judgment to avoid situations that may require his superior skills.”

Yet, aviation history teaches us that airmanship is not defined by the absence of accidents—it is defined by the presence of discipline. It is the quiet, often invisible commitment to preparation, self-awareness, and personal accountability that prevents incidents from ever occurring. And it is precisely this internal discipline that is missing from much of today’s drone training.

The consequences of this gap are not always dramatic, but they are persistent. Many, if not most drone pilots, don’t have a formal pre-flight/post flight “Mission brief”, or understand forecast weather implications, and rely entirely on the return-to-home function without understanding the limitations. They may operate while fatigued, distracted, or under pressure, without recognizing the cognitive load they themselves are carrying. And when things go wrong, they often attribute failure to a system, or a checklist, but not to their own psychological state’s decision-making breakdown.

This behavioral drift is not due to malice or laziness. It is the natural outcome of a training culture that emphasizes regulatory compliance over self-awareness and personal limitations. When training focuses on what to do, but not why, or even IF, to do it. Pilots follow checklists because they are told to, not because they understand their role in managing risk.

The Distortion of Judgment Under Stress

Stress is not just a hypothetical hazard in aviation—it is a constant companion. Whether triggered by environmental conditions, technical anomalies, or mission complexity, stress alters the way pilots perceive, process, and act on information. Under stress, the brain narrows its focus, prioritizes immediate threats, and defaults to habitual and sometimes instinctive behaviors. This is precisely when checklists and preplanned Initial Actions (IAs) are most needed—and most likely missed.

Academic research in aviation psychology has shown that stress impairs working memory, reduces situational awareness, and increases reliance on automation or rigid procedures. In drone operations, where the pilot is physically removed from the aircraft and often operating alone, these effects are magnified. The lack of prepared IA for a broad range of emergency situations can often precipitate an instinctive response and a bigger emergency instead of avoiding one.

Moreover, stress can erode the very qualities that define airmanship: curiosity, humility, and accountability. A stressed pilot may skip steps, ignore anomalies, or rationalize poor decisions, but a resilient pilot who acknowledges their own personal limits will make a better decision prior to many emergencies ever happening. Adversity Quotient or AQ training (Dr. Paul Stoltz, Peak Learning) measures one's ability to recognize, perform and adapt to stress and the unexpected. Learning how you personally respond to stress the 4 key areas of Control, Ownership, Reach and Endurance. (C.O.R.E) can teach you how to respond with resilience under pressure and make better, more timely decisions, before it turns into an emergency.

Case Studies: When Unedited Checklists Fail to Protect

Several psychological and cultural factors contribute to this erosion of airmanship. The Dunning-Kruger effect leads inexperienced operators to overestimate their competence. Outcome bias causes pilots to judge the quality of their decisions based on results rather than process. Automation bias fosters complacency, as pilots defer to systems or software rather than intentionally exercising judgment. Perhaps most insidiously, the cultural drift away from traditional aviation norms means that many drone pilots have never been exposed to the discipline, humility, vigilance, and accountability that defines professional aviation.

Unlike manned aviation, where pilots are immersed in a culture of crew resource management, briefing/debriefing, and continuous self-assessment, drone operations are often solitary and unstructured once they get to a operational organization whose primary focus is crop data collection mapping or infrastructure inspections and now more urgently, in the BVLOS environment. The absence of a cockpit does not just remove physical immersion—it removes the social and psychological scaffolding that supports disciplined decision-making.

Case Studies:

Consider the commercial drone operator who flies in controlled airspace without checking NOTAMs, and relies on geofencing to keep them out of harm's way. Or the fire and rescue safety team that launches urgently during a wildfire without a pre-mission brief, only to lose the drone in smoke-obscured terrain. Or the BVLOS test pilot who trusts on-board automation to understand the implications of a weather shift,

only to be unable to return safely without breaching restricted airspace. In each case, the pilot may have followed a checklist. They may have completed a mission plan. But they did not exercise good judgement or disciplined decision-making. They did not take ownership of the close call or incident, and they did not hold themselves fully accountable for the outcome.

Case 1: The Unmodified SOP

A drone operator conducting infrastructure inspections used a manufacturer-supplied checklist that did not account for local electromagnetic interference. Despite initial signal dropouts, the pilot continued the mission, citing checklist completion as proof of readiness. The drone eventually lost control and crashed. Post-incident analysis revealed that the checklist had not been adapted to the operational environment for that specific mission, and the pilot had not exercised judgment in assessing risk.

Case 2: The Stress-Induced Shortcut

During a time-sensitive rescue mission, a pilot under pressure skipped through the pre-flight checklist quickly, relying on muscle memory and equipment familiarity for success. Mid-flight, a battery warning was missed, and the drone initiated an auto-landing in an unsafe area. The pilot later admitted that stress had “tunneled” his focus onto the mission objective, crowding out procedural discipline.

Case 3: The Checklist as Excuse

In a BVLOS test flight, a pilot encountered unexpected weather but continued the mission, citing that “the checklist said it was within limits and didn’t say to abort.” When questioned, the pilot insisted that all procedures had been followed. The investigation concluded that the failed to assess the pilot’s experience and Fit-to-Fly criteria that would have shown the pilot had ample hours on type but only 1 previous takeoff/landing on this aircraft TYPE in the past 8 months and that was in warm dry climate conditions, on a completely different mission, a 20 minute roof inspection. That should have been a key risk element considered before takeoff.

Toward a New Model of Airmanship

To address these failures, we must move beyond just being commercially certified and ensure commercial drone pilots get operational airmanship training that emphasizes disciplined deliberate decision making as well as insight into their own personal physiological and mental readiness for each flight. This requires a shift in training philosophy—from procedural instruction to cognitive development. Pilots must be taught not just *what* to do, but *why* it matters, *when* to adapt, and *how* to take ownership of personal and crew limitations.

This means including:

- **Checklist Customization:** Encouraging pilots and company operations to use human factors science to personalize checklists based on their mission type including human factors biases and limitations. This fosters engagement, ownership decision making and accountability.
- **Stress Inoculation:** Training pilots to recognize how stress distorts perception, judgement, time sense and decision-making, and learn to develop strategies for maintaining clarity under pressure.

- **Judgment Drills:** Make emergency drills like Initial Actions (IAs) mandatory on irregular schedules if not every flight. Most flights have 30 secs that can be interrupted with a simulated emergency IA that will more likely ensure safer reactions under real conditions. Using scenario-based training to challenge pilots with ambiguous situations where checklists are incomplete or conflicting, forces them to exercise discretion and trust their own decisions.
- **Brief/Debrief Culture:** Embedding structured reflection into every mission, not just to identify procedural lapses, but to explore better cognitive and emotional responses. This feedback loop is essential to consistently and deliberately improving operations.
- **Fit-to-Fly Readiness:** Integrating physiological and psychological self-assessment into pre-flight routines, ensuring that the entire crew—not just the drone—is mission-ready. Any Fit-to-Fly risk assessment should take no more than 20-30 seconds for each crew member and cover at least 10 elements of equipment and personnel criteria and should be done directly before the crew prepares to travel to the worksite or set up equipment.

The Solution: Airmanship as a Human Discipline

Besides checklists that address human factors, we need checklists to be more relevant to the operations and crew where at least one IA is simulated, talked through or practiced before or on every flight. Airmanship must be reframed not as mastery of procedures, but as a mindset—one that is disciplined, decisive, and deliberate. This requires training that goes beyond compliance and cultivates personal and individual crew standards of performance and resilience, not as an academic concept but a personal proactive and regular practice.

Such training must address the full spectrum of human performance. It must include modules on physiology and psychology—teaching pilots to recognize fatigue, manage stress, and understand their own individual biases and sensory limitations. It must instill mission and contingency planning as a cognitive discipline, not just a necessary or legislated paperwork exercise. It must teach leadership and crew resource management, even for solo operators, by emphasizing communication, focus, and feedback. This can develop personal accountability through tools like the Adversity Quotient (AQ) awareness and training by helping pilots understand how they personally respond to stress and how to improve their resilience.

This is not theoretical. These principles are already being taught in advanced training programs that emphasize Fit-to-Fly readiness, mission-first thinking, and the integration of AQ assessments. They are delivered through short, focused modules that respect the time constraints of working professionals while maintaining the discipline of aviation standards. And they are grounded in the lived experience of combat aviation, where the cost of poor decision-making is never abstract.

Conclusion

The checklist is only a visible part of the problem and more easily addressed than the problem is how we teach pilots to self-assess, accountability and problem-solving under pressure. When commercial licensing is treated as just rule compliance with a check mark requirement, flight reviews becomes a

hollow ritual. When discipline and judgement become central to operational training as a means of , qualifying crews it becomes airmanship becomes a cornerstone of Flight Safety.

In the “age of the drones”, where the cockpit is virtual but the risks to others are still real, we must reclaim the mastery of human discipline. We must teach pilots to think, to adapt, and above all, to take responsibility—not just for the flight, but for all the preparation and decisions that shape it.

The future of unmanned aviation safety depends not on better technology, but on better humans. As drones take on more complex autonomous missions and fly BVLOS in more congested airspace, the margin for error will shrink. The only way to ensure safety, effective, and ethical conduct is to cultivate a new generation of drone pilots who think like aviators—even if their feet never leave the ground.

This requires a shift in training philosophy. It requires us to stop asking whether pilots can meet a regulatory and flight standard, and start asking whether they can make disciplined decisions under pressure. It requires us to stop teaching rules and procedures in isolation of , and start teaching disciplined accountability as a way of being. In short, it requires us to reclaim airmanship—not as a relic of manned aviation, but as the foundation of all flight.

Author Bio

The author is a former Combat Flying Instructor and UAS Test Pilot with over 30 years of experience in manned and unmanned aviation. He has served in both military and civilian capacities, including operational deployments and advanced flight test programs. He is the founder of 3DAirmanship.com, and author of the 3D Airmanship Program (a 60 day transformational program for developing good judgement and Airmanship), where he continues to advocate for professional standards in drone operations and airmanship education.

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Would your Operations pass this 3D Airmanship Audit

(Yes on 8 or more)

1. My checklists use Human Factors cues like Size, Shape, Placement, Colour or orientation.
2. Debriefs happen every flight - even uneventful ones.
3. Voice procedure for VLOS LOST is written into our SOPs.
4. Our Fit-to-Fly criteria has more than 8 elements and takes under 30 seconds.
5. Our Mission Briefing is mandatory and includes a Mission Checklist that precedes the Pre-Flight Checklist.
6. If it wasn't briefed we don't fly it.
7. Our Training and Standards includes recurrent proficiency training criteria.
8. Rest Diet and Exercise minimums are written into our Training and Standards Guide.
9. All crewmembers are trained to recognize at least 10 physical signs of fatigue and stress.
10. At least 1 Emergency IA is briefed and practiced every flight.